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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/007,003	11/09/2001	Sujal M. Patel	ISIL.001A	9714

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EXAMINER

CHEN, TE Y

ART UNIT PAPER NUMBER

2171

DATE MAILED: 12/18/2003

7

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/007,003

Applicant(s)

PATEL ET AL.

Examiner

Susan Y Chen

Art Unit

2171

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on 09 December 2002.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☐ Claim(s) 1-42 is/are pending in the application.
- 4a) Of the above claim(s) 21-42 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4 & 6.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

This Action is responsive to application filed on 11/09/2001, in which claims 1-42 are presented for examination. However, as a result of Examiner's request for Restriction, Applicant elected Group 1, claims 1-20 without traversal. IDS filed on 02/07/2002 and 12/09/2002 have been noted, however, since the document # WO 01/14991 a2 is not submitted to the office, hence it is not considered.

Election/Restrictions

Restriction to one of the following invention is required under 35 U.S. C. 121:

- I. Claims 1-20, drawn to a distributed file processing system, classified in class 707, subclass 10.
- II. Claims 21-42, drawn to a modular storage unit processing system, classified in class 712, subclass 28.

Inventions I, and II are related as subcombinations disclosed as usable together in single combination. The subcombinations are distinct from each other if they are shown to be separately usable. In the instant case invention I (a distributed file processing system) has separate utility such as distributing file system. Invention II (a modular storage unit processing system) has separate utility such as store modular unit processing system. Because these inventions are distinct and search groups I and II are not required to be simultaneous, restriction for examination purposes as indicated is proper.

Examiner has conducted a telephone interview with Amy Christensen on Dec. 1, 2003, wherein the Applicants elected Group I, claims 1-20 without traversal for examination.

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Specification

The specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicants may become aware in the specification.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-12 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

As to claim 1, line 2, it is not understood what is the claimed "messaging system" refer to? [i.e., Does it refer to the switching unit, or the remote block manager or others?]

As to claims 2-12, these claims have the same defect as their base claim, hence are rejected for the same reason.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Belsan et al. (U.S. Patent No. 5,403,639) in view of Beardsley et al. (U.S. Patent No. 6,502,174).

As to claim 1, Belsan et al. (hereinafter referred as Belsan) discloses a distributed file system [e.g., Fig. 1] communicating with a plurality of intelligent storage devices [e.g. the set of File Storage Units 11-1 to 11-N, Fig. 1], wherein the distributed file system comprises a messaging system [e.g., the Channel Controller (7), Fig. 1; col. 5, line 55 – col. 6, line 3; the channel Interface Units (201-0 to 201-7), Fig. 3] and configured to

store and manage metadata about files/directories of the system [e.g., col. 5, lines 2-11].

Belsan did not specifically disclose that the storage metadata structure includes locations of metadata block, content data blocks and parity data blocks.

However, Beardsley et al. (hereinafter referred as Beardsley) teaches a storage metadata structure includes locations of metadata block, content data blocks and parity data blocks [e.g., see Fig. 2; col. 4, lines 50-67]. Therefore, with both Beardsley and Beardsley teachings in front of him/her, it would have been obvious for an ordinary skilled person in the art at the time the invention was made to be motivated to modify Belsan's system with the metadata structure taught by Beardsley, because by doing so, the combined system would be able to apply the parity information stored in the metadata structure to perform associated storage segment validation or error checking, therefore, result in a faster storage block data recovery in case of system malfunction.

As to claim 2, Belsan and Beardsley disclosed all the features as claimed by applicant, Belsan further discloses that the system configured to provide different levels of replication and redundancy information stored via the corresponding metadata [e.g., see the snapshot replicating processing, col. 2, lines 26-68, col. 3, lines 11-19].

As to claims 3-4, Belsan and Beardsley disclosed all the features as claimed by applicant, Beardsley further discloses that the redundancy information includes parity information in form of data blocks [col. 4, lines 58-60; Fig. 2].

As to claim 5, Belsan and Beardsley disclosed all the features as claimed by applicant, Belsan further discloses that the file system is configured to change redundancy parameters of a directory when the directory corresponding metadata is updated [e.g., see the steps 624, 625 of Fig. 6; 1005 -1020, Fig. 10; 709-713, Fig. 13; 1504-1506, Fig. 15].

As to claims 6 and 8, Belsan and Beardsley disclosed all the features as claimed by applicant, Belsan further discloses that the file system is configured to copy and replicate data in real-time throughout a subset of the plurality of intelligent storage devices and store the locations of the copied directory data in the corresponding metadata [e.g., see col. 3, lines 11-36; the Snapshot Copy Operation Using Copy Table at col. 21-22].

As to claim 7, Belsan and Beardsley disclosed all the features as claimed by applicant, Belsan further discloses that the system is configured to move data in real-time, wherein the location of the moved data is stored with the associated metadata [e.g., see col. 22, lines 23-47].

As to claims 9-10, Belsan and Beardsley disclosed all the features as claimed by applicant, Belsan further discloses that the system is configured to replicate data in response to a high volume of requests and high utilization of the storage hardware [e.g. see the Staging and De-staging processing at col. 24 – col. 26 & Fig. 18].

Claims 11-20, are rejected under 35 U.S.C. 103(a) as being unpatentable over the combined system of Belsan and Beardsley as applied to claims 1-10 above, and further in view of Mason, Jr. (U.S. Patent No. 5,884, 098).

As to claims 11 -12, the combined system of Belsan and Beardsley did not expressly disclosed the claimed read/write features cited by applicant. However, Mason Jr. (hereinafter referred as Mason) teaches that the claimed features are the general options of the popular storage technology RAID Level 5 processing [e.g. see col. 8, lines 29-32]. As such, it would have been obvious to one of ordinary skilled person in the art at the time the invention was made, to adapt the very popular RAID processing into the combined system of Belsan and Beardsley, because by applying the existing technique of RAID level 5 processing as taught by Mason into the combined system of Belsan and Beardsley, the system would provide a handy read-modify-write operations for storage data block I/O processing.

As to claims 13-14, the combined system of Belsan, Beardsley and Mason disclose the features as claimed by applicant, including

a) a plurality of storage units for storing data blocks [e.g., see the memory(14), the storage structure units of Functional Address Space 12-13, Fig. 1 of Belsan];

b) receive data file read request [e.g. the copy command received by the Data Storage Subsystem, Fig.5 of Belsan], retrieve data file location information corresponding to the request via lookup the locally stored data blocks [e.g. see the look up Virtual Track Address in the Virtual to Logical Map processing 605, Fig. 6 of Belsan], get the requested data from remote storage units [e.g., see 605-623, Fig. 6 of Belsan] and return it back to the requestor [e.g., see the return processing (601- 604), Fig. 6 of Belsan; Figs. 5-7, Fig. 11 of Belsan].

As to claims 15-16, the combined system of Belsan, Beardsley and Mason further disclose the system having a write module in communicating with the switch component [e.g., the module 705, Fig. 13 of Balsan] to write and distribute the plurality of data blocks among at least two of the storage units [e.g., see the write operation of Figs 13 and 15 of Balsan, wherein, the data blocks are distributed to the at least two of the storage units – the cache memory and the secondary media logical device].

As to claims 17-20, the combined system of Belsan, Beardsley and Mason further disclose the write module is configured to mirrored data corresponds to the distributed parity protection information of the write request [e.g., see col. 10, lines 13-35 of Balsan].


Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure are: Row et al. (U.S. Patent No. 5,163,131) which disclosed a virtual file system for managing parallel network I/O data; Hitz et al. (U.S. Patent No. 6,038,570) which disclosed a RAID controller system utilizing pointers to manipulate the data block allocation of a file system.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Susan Y Chen whose telephone number is (703) 308-1155. The examiner can normally be reached on Monday - Friday from 7:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Safet Metjahic can be reached on (703) 308-1436. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-6296.


UYEN LE
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Susan Chen
Dec. 05, 2003